

Executive Summary

The ocean monitoring program for the Point Loma Ocean Outfall (PLOO) is conducted in accordance with NPDES permit requirements for the Point Loma Wastewater Treatment Plant (PLWTP) operated by the City of San Diego (NPDES Permit No. CA0107409, Order No. R9-2002-0025). These documents specify the terms and conditions that allow PLWTP effluent to be discharged into the Pacific Ocean via the PLOO. Additionally, Monitoring and Reporting Program (MRP) No. R9-2002-0025 contained within the above permit defines the requirements for monitoring the receiving waters environment, including the sampling plan, compliance criteria, laboratory methods, data analysis, and reporting guidelines. Furthermore, the above MRP was modified effective August 1, 2003 with the adoption of Addendum No. 1 (see City of San Diego 2004).

The main objectives of the Point Loma ocean monitoring program are to provide data that satisfy NPDES permit requirements, demonstrate compliance with the 2001 California Ocean Plan (COP), monitor dispersion of the waste field, and identify any environmental changes that may be associated with wastewater discharge. Specifically, the program was designed to assess the effects of wastewater discharge on ocean water quality, sediment conditions, and the marine biota. The study area is centered around the PLOO discharge site, which is located approximately 7.2 km offshore of the treatment plant at a depth of 94–98 m. Monitoring at sites along the shore extends from Mission Beach southward to the tip of Point Loma. Offshore monitoring is conducted in an adjacent area overlying the coastal continental shelf at sites ranging up to about 116 m in depth.

The receiving waters monitoring effort for the Point Loma region is divided into several major components, each comprising a separate chapter in this report: Oceanographic Conditions, Microbiology, Sediment Characteristics, Macrobenthic Communities, Demersal Fishes and Megabenthic Invertebrates, and

Bioaccumulation of Contaminants in Fish Tissues. Data regarding physical and chemical oceanographic parameters are evaluated to characterize water transport potential in the region. Water quality monitoring along the shore and in offshore waters includes the measurement of bacteriological indicators to assess natural and anthropogenic impacts. Benthic monitoring includes sampling and analysis of soft-bottom macrofaunal communities and associated sediments, while demersal fish and megabenthic invertebrate communities are the focus of trawling activities. The monitoring of fish populations is supplemented by bioaccumulation studies to determine whether or not contaminants are present in the tissues of “local” species.

In addition to the above activities, the City supports other projects relevant to assessing ocean quality in the region. One such project is a remote sensing study of the San Diego/Tijuana coastal region that is jointly funded by the City and the International Boundary and Water Commission (IBWC); results from this study are incorporated herein into the interpretations of oceanographic and microbiological data (see Chapters 2 and 3). A long-term study of the Point Loma kelp forest funded by the City is being conducted by scientists at the Scripps Institution of Oceanography and these data were recently summarized in City of San Diego 2003. Finally, the current MRP includes plans to perform adaptive or special strategic process studies each year as determined by the City in conjunction with the RWQCB and the USEPA. Such studies have included a comprehensive scientific review of the Point Loma ocean monitoring program and a sediment mapping study for both the Point Loma and South Bay coastal regions (see SIO 2004, Stebbins et al. 2004).

This report focuses on the results of the ocean monitoring activities conducted off Point Loma during the calendar year 2005. A general overview and summary of the main findings for each major monitoring component are included below.

Analysis of the receiving waters monitoring data off San Diego indicates that the PLOO discharge has had only a limited effect on the local marine environment after 12 years of wastewater discharge at the present location. For example, despite heavy rainfall that periodically affected nearshore water quality during 2005, water samples collected at sites within the Point Loma kelp bed were over 90% compliant with COP bacterial water-contact standards. The few incidences of non-compliance occurred in January and were related to stormwater runoff during periods of heavy rainfall, not to the intrusion of the wastewater plume. In addition, there is no evidence that the waste field from the outfall has affected any shoreline sampling site since the outfall was extended in 1993. Elevated bacterial concentrations that could be attributable to wastewater discharge were limited primarily at depths of 60 m or below. Finally, no evidence of change in any physical or chemical water quality parameter (e.g., dissolved oxygen, pH) has been found that can be attributed to the discharge of wastewater off Point Loma.

Similar to previous years, the benthic conditions off Point Loma in 2005 continued to show some changes that may be expected near large ocean outfalls, although these were restricted to a relatively small, localized region near the discharge site. For example, sediment quality data have indicated slight increases over time in terms of sulfide and BOD concentrations at sites nearest the Zone of Initial Dilution (ZID), as well as the accumulation of coarse sediment particles. However, other potential indicators of environmental impact such as concentrations of sediment contaminants (e.g., trace metals, pesticides) showed no patterns related to wastewater discharge. For example, although metal concentrations in Point Loma sediments increased from the previous year, the increases were regionwide and likely related to sources other than the PLOO (City of San Diego 2006). In addition, descriptors of macrobenthic community structure (e.g., abundance, diversity) or indicators of environmental disturbance (e.g., brittle star populations) have shown temporal differences between reference areas and those nearest the ZID. However, calculations of environmental disturbance

indices (i.e., BRI, ITI) used to evaluate the condition of benthic assemblages relative to threshold values suggest that the macrobenthic communities in the Point Loma region remain characteristic of natural conditions. Analyses of demersal fish and invertebrate communities also reveal no spatial or temporal patterns that can be attributed to effects of the PLOO. The paucity of pathological evidence from local fishes and the bioaccumulation of contaminants in liver or muscle tissues also suggest that the local fish community remains healthy and not adversely affected by wastewater discharge or other anthropogenic inputs. Consequently, there is currently no evidence of significant long-term impacts on either sediment quality or biotic communities in the coastal waters off San Diego.

LITERATURE CITED

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